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Extending the multiple-goal perspective to tertiary classroom goal structures

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The multiple-goal perspective has recently been applied to teacher behaviours in primary school classrooms through experimental intervention (Linnenbrink, 2005) and objective observation (Sideridis, 2005). However, there is evidence suggesting that rather than centered only on teacher behaviour, classroom goal structures are a whole class feature (Urdan, 2004c). Despite intended or observed classroom goal structures, students' perceptions of the same classroom can vary (Wolters, 2004). Furthermore, students' pre-existing personal goal orientations may shape their perceptions of classroom goal structures (Lyke & Kelaher Young, 2006). An investigation with tertiary students in naturalistic learning contexts will extend achievement goal theory to a multiple-goal perspective of classroom goal structures.

Achievement goal theory, multiple-goal perspective, classroom goal structures, tertiary students

INTRODUCTION

Historically achievement goal theory has served as a prominent perspective of students' personal academic motivations. More recently goal theory has become a lens through which the motivational emphasis of classroom environments has been viewed. Consistent with the interest in concurrent student endorsement of different levels of different personal achievement goal orientations (e.g., the interactive pattern of high mastery and high-performance goals, see Barron & Harackiewicz, 2001), the investigation of multiple classroom goal structures has emerged in primary school settings using experimental techniques (Linnenbrink, 2005) or observations of teacher behaviours (Sideridis, 2005). There is currently no research that provides field-based evidence that students themselves perceive interactive multiple goal structures in classrooms. Moreover, relations between perceived interactive multiple classroom goal structures and other student variables are not known, nor are the causal directions of these relationships. An investigation with tertiary students in actual classroom settings can address such issues. However, before these questions can be answered, there are a number of methodological concerns that must be clarified and overcome. This paper identifies several important factors that require consideration before the multiple-goal perspective can be extended to student perceptions of tertiary classroom goal structures. First, an overview of the multiple-goal perspective is provided. The need to capture holistic views of classroom goal structures is then identified before the importance of student perceptions, and the significance of causal relationships between students' personal attributes, such as goal orientations, with perceived classroom goal structures and other environmental variables are discussed.

THE MULTIPLE-GOAL PERSPECTIVE

Achievement goal theory is a conceptual tool for understanding motivation in academic contexts (Kaplan & Middleton, 2002). Mastery and performance goals are considered the primary reasons **why** students engage in academic behaviours. Mastery goals reflect students' pursuit of developing academic competence while performance goals are held by students whose primary focus is on competing and demonstrating their ability relative to others (Ames, 1992). Early work suggested that mastery goals were associated with beneficial learning patterns such as a focus on effort and strategy to meet academic challenges, whereas performance goals were either not linked or had a negative relationship with such adaptive patterns (Dweck & Leggett, 1988). A revision of this normative theory saw the division of performance goals into approach and avoidance forms (Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997; Wolters, Yu, & Pintrich, 1996). When students adopt performance-avoidance goals and try not to appear worse than others, research consistently reveals an association with unfavourable outcomes such as a negative impact on academic performance and intrinsic motivation (Church, Elliot, & Gabel, 2001; Elliot & Church, 1997). However, it is debatable whether the effects of performance-approach goals, or those goals that students adopt when wanting to demonstrate high relative ability, are good or bad in comparison to mastery goals (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Kaplan & Middleton, 2002; Midgley, Kaplan, & Middleton, 2001). For example, although performance-approach goals appear to be associated with higher grades, it is often at a cost of factors such as interest, which is consistently related to mastery goals (Elliot & Church, 1997; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Harackiewicz, Barron, Tauer, & Elliot, 2002).

Aside from whether factors such as the heightened comparative academic achievements associated with performance-approach goals should be perceived as beneficial over mastery goals, the performance–avoidance and –approach distinction has certainly advanced achievement goal theory beyond a dichotomous framework. In fact, an investigation of a mastery-avoidance goal orientation, whereby students aim to avoid misunderstanding or not learning, has resulted in a four factor achievement goal model (Elliot & McGregor, 2001). In addition to the academic motivations of mastery and performance goals, the importance of social goal orientations, based on a long theoretical tradition (e.g., McClelland, 1955 cited in Covington, 2000; see also Urdan & Maehr, 1995), is also emerging (e.g., Dowson & McInerney, 2001; Dowson, McInerney, & Nelson, 2006; Elliot, Gable, & Mapes, 2006; Nelson, O'Mara, McInerney, & Dowson, 2006; Wentzel, 1993). Although there is a need to extend further achievement goal theory through the continued investigation of mastery-avoidance and social goals, it is the distinction between approach and avoidance forms of performance goals that are central to the current multiple-goal perspective and therefore the focus of this paper through its extension to the classroom environment.

The multiple-goal perspective asserts that both mastery and performance-approach personal goal orientations can and do have positive effects. Four potential multiple-goal patterns between mastery and performance-approach goals have been suggested (Barron & Harackiewicz, 2001). An **additive goal pattern** may exist when each goal independently has a positive main effect on the same outcome (e.g., Wolters et al., 1996). A **specialised goal pattern** is thought to be evident when mastery and performance approach goals are positively associated with different outcomes (e.g., Elliot & Church, 1997). The **interactive goal effect** suggests that a combined high mastery and high performance-approach goal orientation may be more advantageous (e.g., Pintrich, 2000b). A **selective goal pattern** would be evident if students chose different goals based on situational cues (e.g., Linnenbrink, 2005). To test these four multiple-goal patterns of personal goal orientations against normative goal theory, the multiple-goal perspective not only requires the investigation of the independent versus interactive effects of mastery and performance-

approach goals on multiple outcomes (Harackiewicz, Barron, Pintrich et al., 2002), but the selective goal pattern also calls for an appreciation of the learning context relative to personal goals.

Two popular approaches of evaluating situational cues in school classrooms have been the TARGET (task, authority, recognition, grouping, evaluation, and time) system (Ames, 1992; Epstein, 1988) and *Patterns of Adaptive Learning Survey* (PALS, Midgley et al., 1996). Based on student reports of the salience of teachers' instructional practices and policies in creating an emphasis on particular goals in the school and classroom, the original PALS instrument has been used extensively in primary (e.g., Anderman & Midgley, 1997; Kaplan & Maehr, 1999; Ryan, Gheen, & Midgley, 1998; Urdan, Midgley, & Anderman, 1998; Young, 1997) and secondary (e.g., Kaplan, Gheen, & Midgley, 2002; Roeser, Midgley, & Urdan, 1996) contexts. It is this application of the achievement goal theory to evaluate the goal-related messages that students receive from teachers in classroom environments that has provided the foundation for the potential to extend the multiple-goal perspective to the classroom. By measuring classroom goal structures the four personal multiple achievement goal patterns could potentially be applied directly to the learning environment rather than only to personal goal adoption.

Like much of the early personal achievement goal research under the normative perspective, many investigations measuring students' perceptions of their classrooms goal structures have been based on hybrid performance-approach and avoidance measurements (e.g., Gutman, 2006; Turner et al., 2002; Urdan & Midgley, 2003). This has meant that although some earlier classroom environment work has measured student perceptions of both mastery and performance goal structures, without a defined approach and avoidance distinction of the performance goal structure, the results cannot be directly conferred with the multiple-goal perspective. In order to apply empirically the multiple-goal perspective to investigations measuring students' perceptions of actual classroom goal structures, the first step is the development of a survey instrument with a distinct approach form of performance goal structures. The PALS instrument has provided an opportunity for this development.

Some researchers have attempted to distinguish items pertaining to performance-approach high school classroom goal structures from the confounding avoidance items in the PALS instrument (Kaplan et al., 2002; Urdan, 2004c; Wolters, 2004). It seems, however, that they have done little more than separate out the approach from avoidance performance goal structure scales. For example, Urdan (2004c) identifies the two forms of performance goal structures, but does not empirically divide them. In addition, mastery goal structures were not used in any analyses, therefore precluding the application of the multiple-goal perspective. Conversely, Kaplan et al. (2002) and Wolters (2004) report a moderately reliable performance-approach ($\alpha = 0.79$ and $\alpha = 0.69$ respectively), as well as mastery classroom goal structures ($\alpha = 0.83$ and $\alpha = 0.70$ respectively), based on PALS scales from respective English and mathematics high-school student perceptions. While both studies report findings consistent with some patterns of the multiple-goal perspective as applied to classroom goal structures, neither study locate their findings as such.

For example, while at a student level Wolters' (2004) study can be interpreted as demonstrating some multiple classroom goal structure patterns, the unintentional application has meant that to date there has been no field investigation of the interactive multiple classroom goal effect. It is not known, therefore, whether combined perceptions of high mastery and high performance-approach classroom goal structures are advantageous, as suggested by proponents of the revised goal theory (e.g., Barron & Harackiewicz, 2001), or whether the most adaptive associations occur with mastery only goal structures, as recommended under the normative goal tradition (e.g., Kaplan & Middleton, 2002). Consequently, the question of whether or not students actually report multiple contextual goals remains unanswered (Pintrich, Conley, & Kempler, 2003). Wolters'

(2004) study, however, does confirm an additive multiple classroom goal pattern with mastery and performance-approach goals each having independent, positive main effects on self-reported cognitive and metacognitive learning strategies. A selective pattern also appears through the relationship between perceived mastery and performance-approach goal structures and students reports of their respective personal goal orientations. However, while mastery classroom goal structures were positively associated with confidence in mathematics ability, motivational engagement including effort and persistence and grades in mathematics, because performance-approach classroom goal structures were not positively associated with different outcomes a specialised goal pattern cannot be inferred. Without comparison against the interactive effects of high mastery and high performance-approach classroom goal structures, these results from Wolters' (2004) study support the normative position that mastery only goal structures are most favourable.

While substantial PALS-based classroom goal structure research has been conducted in primary (e.g., Anderman et al., 2001; Ryan et al., 1998; Turner et al., 2002; Urdan et al., 1998) and secondary (e.g., Kaplan et al., 2002; Urdan, 2004b; Wolters, 2004) settings, there is one such study known in a tertiary classroom (Lyke & Kelaher Young, 2006). However, unlike some of the school classroom research, the single tertiary study conducted in an American college, did not consider the nested nature of students within classrooms. Similarly, other non-PALS studies associated with perceived contextual classroom characteristics conducted at the tertiary level have not considered the amount of variance within and between tertiary classrooms (e.g., Barron & Harackiewicz, 2003; Joiner, Malone, & Haimes, 2002; Karabenick, 2004). In order to reduce this notable gap in post-school classroom environment research, an investigation of Australian university students' perceptions of classroom goal structures and other classroom climate variables at the student and classroom-levels must be conducted.

An investigation of tertiary students self-reported classroom goal structures will extend achievement goal theory to a multiple-goal perspective of classroom environments which includes the unexamined interactive multiple classroom goal structure effect. Questions of whether tertiary students perceive multiple contextual goals and what is the most adaptive contextual goal structure must be addressed. Testing of all multiple classroom goal structure patterns is possible through an investigation of multiple potential outcomes including academic self-concept, study strategies, and achievement. Additionally, indications of the influence perceived classroom context and personal characteristics have on one another is possible through the measurement of personal variables before and after semester long classroom interactions. However, to design such investigations several methodological issues grounded in the major underlying assumptions of previous work require careful consideration. The classroom goal structure is predominantly accentuated by teacher behaviour. Between classroom differences should be the primary unit of analysis. Furthermore, the learning context is the primary influence on student outcomes including personal goal orientations. The following sections of this paper address these assumptions.

WHOLE CLASSROOM GOAL STRUCTURES

Having a sound instrument to measure performance-approach as well as mastery classroom goal structures is vital for extension of the multiple-goal perspective to learning environments. However, it is important to consider whether the definition and meaning of the measurements are representative of the construct. The popular method which assumes that it is the teacher's approach to instruction that dominates the classroom context, for example PALS (Midgley et al., 1996), may not be best practice. This is reflected in the revision of the original PALS scales (Anderman & Midgley, 1997; Midgley et al., 1996) to include additional scales that consider perceptions of classroom goal structures that are not entirely based on teacher behaviour (Midgley et al., 2000). Nevertheless, the original teacher-focused PALS instrument is still prominent in

recent studies (e.g., Gutman, 2006; Kaplan et al., 2002; Turner et al., 2002; Urdan, 2004b; Urdan & Midgley, 2003).

Teachers who involve students, encourage interactions between students, emphasise effort in task engagement, and show support and concern about student learning are thought to exhibit a high mastery focus. A high performance emphasis on the other hand suggests that teachers champion a public comparison of students' performances (Patrick, Anderman, Ryan, Edelin, & Midgley, 2001). While much attention has been given to such teacher behaviours, there is limited support for the notion that what a teacher aims to emphasise, or appears to emphasise, in a classroom is consistent with the messages that students receive. Although one study found that teachers' reported instructional goal emphases were significantly associated with high school students' aggregate perceptions of respective classroom goal structures (Kaplan et al., 2002), other studies are less convincing. For example, research in primary classrooms has been unable to confirm correlations between self-reports or observations of teacher goal referenced practices with student perceptions of the same salient classroom goal structures (Anderman et al., 2001; Urdan, 2004b; Urdan et al., 1998). Rather, students' views of their common learning context varied considerably. Inconsistent teacher-student views of the classroom suggest that there are other factors which contribute to students' perceptions of classroom goal structures in addition to the teachers' self-determined or objectively reported classroom goal emphasis. While these between-student differences are important, and may be influenced by the manner in which students filter the messages based on their own personal characteristics such as goal orientations, it may also be that students themselves influence the functioning of whole classroom dynamics, not just teacher behaviours. Another concern is that students' responses to the PALS teacher-focused instrument may reflect perceptions of teacher personality and likeability rather than measuring the intended variable of the salience of the teachers' mastery or performance emphasis in the classroom (Urdan, 2004b).

The very fact that classrooms contain more than only a teacher means that the emphasis of classroom goal structures for any given student may reflect more than just their teachers' policies and practices. As Urdan (2004c, p. 255) states in an argument for tapping into students' perceptions about the shared culture of potential performance goal structures, "It is possible that students may perceive a culture of competition and social comparison in the classroom that is driven more by student attitudes and behaviors than by teacher behaviors." The conception of a shared classroom culture rather than one heavily reliant upon teacher practice reflects an interest in the psychosocial climate of classrooms (Fraser, 1980) and means that the whole classroom should be reflected in measurement items.

Urdan (2004c) presents a modified version of the revised PALS performance classroom goal structure scale that asks students to report on both approach and avoidance forms which they perceive as a function of their class as a whole. A unique feature of Urdan's (2004c) performance-approach classroom goal structure scale is its reportedly orthogonal, or slightly related, relationship to the mastery classroom goal structure scale, although further analysis of perceived mastery classroom goal structures were not conducted in the study. The orthogonal relationship is an important consideration when interested in the potential of a perceived interactive pattern of classroom goal structures (e.g., simultaneously reported high mastery and high performance-approach classroom goal structures) because orthogonal reports of mastery and performance-approach personal goal orientations are thought to increase the possibility of an interactive multiple-goal pattern existing between personal achievement goals (Pintrich et al., 2003). Orthogonally related classroom goal structure scales also reflect observational research findings from primary school classroom contexts (Patrick et al., 2001). Therefore, investigations using the slightly related mastery and performance-approach classroom goal PALS scales as modified by Urdan's research (2004c) enable a well established instrument to be used to extend the multiple-goal perspective to classroom goal structures.

A greater understanding of the ways that students view the functioning of their whole classroom environment is possible if features of the classroom other than only goal structures are also examined. Based on research spanning over a decade, Moo's (1979) conceptualised that social environments, including educational contexts, could be represented by three domains; relationships, personal growth, and system maintenance and change. The *College and University Classroom Climate Inventory* (CUCEI, Fraser & Treagust, 1986) was developed in Australia to assess specifically students' perceptions of small tertiary classroom environments consistent with Moo's three domains. Since its inception, the CUCEI has been successfully used in several tertiary contexts including classrooms in Singapore (Myint & Goh, 2001), United States (Bruck, Hallett, Hood, Macdonald, & Moore, 2001; Pulvers & Diekhoff, 1999), and Australia (Clarke, 1990; Fisher & Parkinson, 1998; Joiner et al., 2002). An investigation with tertiary students that combines the measurement of classroom goal structures with an investigation of other classroom climate variables as measured by the CUCEI can determine whether there is a pattern between perceived classroom goal structures and other classroom climate features. Such an investigation cannot only identify whether or not tertiary students' perceive multiple classroom goals, but whether those students who perceive classrooms with an emphasis on multiple or single goals report similar patterns of classroom climate variables and ways that such environmental features interact with specific personal variables.

Another requirement to apply the different multiple-goal patterns to classroom goal structures is the investigation of multiple student variables. It has been suggested that negative effects of performance goals may only be evident when students are faced with difficulty and their perceptions of competence are lowered (Dweck & Leggett, 1988). Academic self-concept is one aspect of a multidimensional construct pertaining to self perceptions of relative ability (Marsh, 1990). Thus, a shared achievement situation may present differing perceptions of difficulty for students and therefore have differential effects on their academic self-concept. Although very little is known about the interplay between self-concept and learning contexts, an investigation of tertiary students' academic self-concept and their reports of classroom goal structures, including an application of a multiple-goal perspective, may facilitate an appreciation of the relationship between these two dimensions.

WITHIN-CLASSROOM VARIATION OF PERCEPTION

In addition to the previous idea that whole classroom goal structures need to be investigated, it is now suggested that despite the intended classroom goal structures, such as those managed under experimental conditions (Barron & Harackiewicz, 2001; Elliot & Harackiewicz, 1996; Linnenbrink, 2005), or objective observations of the goal structures in classrooms (Patrick et al., 2001; Sideridis, 2005; Turner et al., 2002), students' perceptions of the same classroom can vary (Kaplan et al., 2002; Wolters, 2004). The potential for within-class variation calls for the investigation of individual, subjective student perceptions of the classroom rather than a focus on the intended or objective reality of teacher policies and practices (Ames, 1992; Church et al., 2001; Meece, Anderman, & Anderman, 2006). Survey assessments offer a resource efficient, practical, and non-intrusive method to gather such individual views (Fraser & Walberg, 2005). The investigation of student perceptions does not, however, necessarily mean that an understanding of those factors associated with whole classroom variance cannot be explained if appropriate analysis techniques are employed.

Apart from researchers being able to create puzzle tasks that emphasise one goal condition over another (Elliot & Harackiewicz, 1996; Senko & Harackiewicz, 2005) and combined goal conditions (Barron & Harackiewicz, 2001), teachers in actual classrooms are observed also to be successful at creating intended goal structures (Anderman et al., 2001; Urdan, 2004b) including multiple classroom goal structures of combined mastery and performance-approaches (Linnenbrink, 2005). It appears, however, to be difficult for teachers to enact consistently with

purpose either a mastery or performance dominant goal structure (Anderman et al., 2001; Linnenbrink, 2005; Urdan, 2004b) and experimental tasks are short-term controlled activities unlike conditions in actual classrooms. Additionally, investigations of intended and observed classroom goal conditions tend to focus on the environmental circumstances as the direct cause of student outcomes (Urdan, 2004b is an exception) while they are unable to address questions akin to "How do different students in the same classroom perceive and respond to potential goal messages?" (Urdan, 2004b, p. 230). Studies that go some way in answering such questions and explore the causal directions of the relationships between personal and classroom variables use survey data of individual student perceptions.

There are several other main reasons why when interested in environment-person associations that student reports of the psychosocial environment of classrooms are considered more important than observed assessments (Ames, 1992; Wolters, 2004). Over the course of their education most students spend considerable time experiencing a variety of different learning contexts. This is particularly true by the time that students attend university, making students somewhat experts in forming impressions about classroom environments. Student reports capture this so-called 'expert' data that an observer could miss or not identify as important. While day-to-day teacher behaviour and classroom dynamics may appear to be inconsistent to an occasional observer, students are in a position to obtain a long-standing, overall impression (Fraser & Treagust, 1986). It is through the examination of the psychometric properties of survey instruments, including their construct validity and reliability, that theories such as achievement goals can be applied to contextual influences and tested with confidence. Furthermore, large sample sizes can efficiently be obtained thus enabling the measurements gathered to afford generalisation (Turner et al., 2002).

Consistent with the view that survey reports of the common contextual factors operating in a classroom influence individual student learning related qualities, including personal goal orientations (i.e., the selective goal pattern) (Meece et al., 2006), a between-class model is expected to attain the best fit for goal structure variance. As a result, between classroom-level differences of students' perceptions of classroom goal structures are often favoured over an interest in between student-level differences (e.g., Kaplan et al., 2002; Pintrich et al., 2003; Sideridis, 2005). However, if questions pertaining to whether or not the different multiple-goal patterns found with relation to individual personal achievement goals can also be found for perceived actual classroom goal structures, not only does the subjective rather than objective component of the learning environment need to be ascertained, but those individual perceptions need to be central to the data analysis rather than only aggregated into class-level perceptions. That is not to deny, however, that students' are nested within classrooms and so the commonality of the classroom environment contributes uniquely to patterns of students' cognition and behaviour (e.g., Urdan, 2004b). In fact, students in a particular classroom are expected to be more similar to each other and to students in other classrooms of the same school (i.e., nested at classroom and school levels) than they would be to students from a classroom located in another school. This is because students are not randomly assigned to classrooms or schools, rather students in the same classroom and school generally come from populations that are homogeneous by geographical region in the very least (Osborne, 2000). Therefore, while some variance between schools can be expected, the amount of within- and between- class variance remains questionable.

Hierarchical linear modelling (HLM) is an analysis technique that not only enables the effects of within-class variations of perception as well as between-class differences to be investigated, but it has the potential to estimate the amount of variance that classroom-level influences have on student-level differences by controlling for them. For example, school students self-reported perceived mastery goal structure (16% and 28% in respective studies) and performance goal structure (9% and 29% in respective studies) has been attributed to classroom level variability

(Kaplan et al., 2002; Urdan, 2004b). Because tertiary students spend less time each week in the same classroom than school students do for any given topic, an investigation of tertiary classroom-level variance of goal structures may be less than those reported in school based studies. Indeed, a non-PALS based investigation in tertiary classrooms reported a five percent between-class variance for both mastery and performance-approach classroom goal structures (Karabenick, 2004), far less than those school classroom studies formerly cited. However, further research using HLM techniques is clearly required to extend the understanding of within and between tertiary student perceptions of classroom environments.

CAUSAL RELATIONSHIPS

The recognition that goals are not traits, as defined by classic personality and social psychology traditions, means that personal achievement "goals are assumed to be cognitive representations or knowledge structures which are sensitive to both contextual and internal personal factors" (Pintrich, 2000a, p. 102). The capacity for the learning context to exert some influence on personal achievement goal orientations and other personal characteristics is therefore conceivable. Indeed, there is considerable evidence that a relationship exists between the same respective classroom goal structures and personal achievement goals at all levels of education (e.g., Anderman & Midgley, 1997; Karabenick, 2004; Wolters, 2004; Young, 1997). However, relations are sometimes at low levels (e.g., non-significant relationship between personal and contextual performance goals, $r = 0.24$ between personal and contextual mastery goals, Gano-Overway & Ewing, 2004) and the causal direction is less well established.

Whether the classroom environment influences students' personal goal orientations or other personal variables (e.g., self-concept, study strategies, and achievement) has important implications for modification of the classroom environment as a tool for motivating students to learn. If the claim that the achievement goal messages evident in the learning environment can influence individual personal goal orientations, or other learning related variables, then aspiring to create a classroom where either interactive multiple-goal structures (i.e., under the revised goal theory) or mastery only goal structures (i.e., under normative theory) may lead to the promotion of adaptive personal learning goals and other positive outcomes for students (for recent reviews see Meece et al., 2006; Urdan, 2004a). However, if perceived classroom goal structures are largely due to the personal goal orientations, or other personal factors, that students hold prior to their participation in a particular classroom, then attempts to improve environmental features can yield little by way of student learning gains. This may be particularly true for older students because context may have less of an influence with age. Postsecondary students are assumed to be more able to self-regulate (Pintrich et al., 2003), therefore offering more support for the hypothesis that students existing personal goal orientations will influence their perceptions of the classroom environment at the tertiary level rather than the other way around.

While some experimental studies with college students using puzzle tasks (Elliot & Harackiewicz, 1996; Senko & Harackiewicz, 2005) have suggested that it is possible to manipulate participants to display certain goal related behaviours such as performance ability, another experimental study with college undergraduates clearly demonstrated that the effects of assigned goals were moderated by personality factors (Barron & Harackiewicz, 2001). The latter study provides some experimental support for the hypothesis that existing personal characteristics may influence student outcomes over and above the influence of environmental conditions. The pattern of interaction between classroom environment and student outcomes has been demonstrated in actual university learning environments, but generally in association with limited environmental variables, without accounting for students being nested within classrooms, and with unknown causal relationships.

Studies in naturalistic environments with university students have generally either exposed all students to the same lecture-based learning environment (e.g., Elliot & Church, 1997; Harackiewicz et al., 1997) or differences within and between smaller classes were not reported. For example, the classroom environment variables of lecture engagement, evaluation focus, and harsh evaluation of two introductory chemistry courses, one with absolute grading the other with normative grading, were considered by Church et al. (2001). However, the learning context that was evaluated combined both lectures and small discussion groups and the potential between-class variation of the discussion groups was not investigated due to too few classes in the sample.

In a series of other studies, Harackiewicz, Elliot and colleagues (Elliot & Church, 1997; Harackiewicz et al., 1997; Harackiewicz et al., 2000; Harackiewicz, Barron, Tauer et al., 2002) investigated psychology students achievement goals and educational outcomes, particularly interest and normatively graded performance based on multiple choice exams, specifically in lecture-only tertiary courses. To test the idea that it is the learning context which defines the effect that personal goal orientations have on outcome variables, Barron and Harackiewicz (2003) sought to examine the relationship between college students personal mastery and performance-approach goals and perceived classroom goal structures to their interest, and final grades (based on written assignments, class participation, presentations, projects, and essay exams) in seminar classes with a cap of 25 students. Contrary to expectations, however, the study reported the same relationships of mastery goals being linked to interest and performance goals predicting grades as for the previously investigated lecture-based, exam-evaluated courses. However, the study did not consider the nested nature of the students in tutorial classes, nor did it investigate the relationship between students' personal goal orientations at the beginning of the semester with their reports of classroom goal structure toward the end of semester, despite having collected the data to do so. Similarly, a study with college students attending physical activity classes did not directly examine whether beginning of semester personal goal orientations predicted end of semester motivational climate reports although the data to conduct the analysis was collected (Gano-Overway & Ewing, 2004).

However, there is one known PALS-based study in a tertiary context that has considered the causal direction between personal achievement goals and classroom goal structure. Lyke and Kelaher Young (2006) found that pre-tested mastery goal orientations were positively correlated with perceived mastery classroom goal structure ($r = 0.33$) and existing performance achievement goals were related to reported performance goal structure ($r = 0.19$). They concluded that "Classroom goal structure may very well be in the eye of the beholder" (Lyke & Kelaher Young, 2006, p. 487). In support of this finding is a much less recent study with younger students. It was reported that 13-18 year old science students found that personal mastery goals affected later reports of mastery goals both directly (t-value = 0.57) and through perceived teacher goals (for students to master content and to think independently, t-value = 0.46) leading the researchers to conclude that "it seems clear from this strong relationship that students' task orientation colors their perceptions of what the teacher is trying to achieve" (Nolen & Haladyna, 1990, p. 123). Consequently, while personal achievement goal orientations have long been situated with the influence of classroom context (for reviews see Ames, 1992; Blumenfeld, 1992; Meece et al., 2006; Urdan, 2004a), it may be that the causal direction of the interaction is from personal goals to perceptions of the classroom environment rather than the often suggested but unverified reverse causality.

CONCLUSIONS

While personal achievement goal orientations and classroom goal structures are distinct constructs (Urdan, 2004a; Wolters, 2004), this paper suggests that the multiple-goal perspective currently applied to personal goals can be extended to the naturalistic classroom environment at the tertiary level. Investigations of tertiary students' perceptions of mastery and performance-

approach classroom goal structures are needed to advance achievement goal theory by addressing several underlying assumptions and gaps in previous research. Such investigations can extend the work of Lyke and Kelaher Young (2006) by not only considering the causal relationships between personal and contextual achievement goals but also explore the interactions between classroom goal structures and other classroom climate variables from a whole classroom perspective. Within and between classroom differences must also be investigated.

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